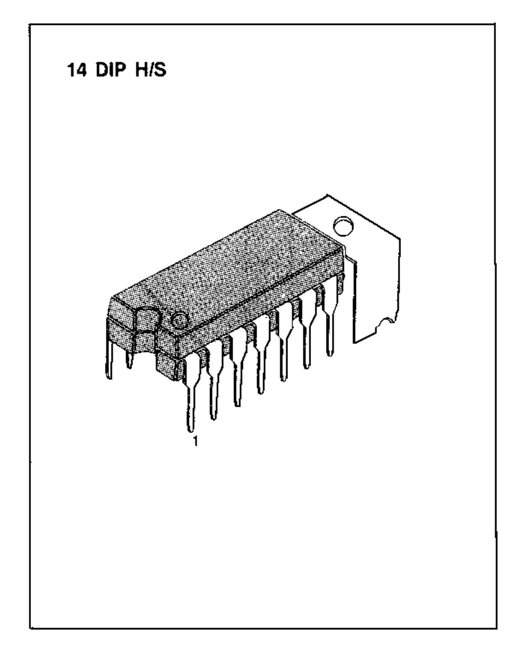
ONE-CHIP TAPE RECORDER SYSTEM

The KA2213 is a monolithic integrated circuit consisting of a preamplifier, ALC circuit, power amplifier in a 14-pin plastic dual in line package with heat sink.



FEATURES

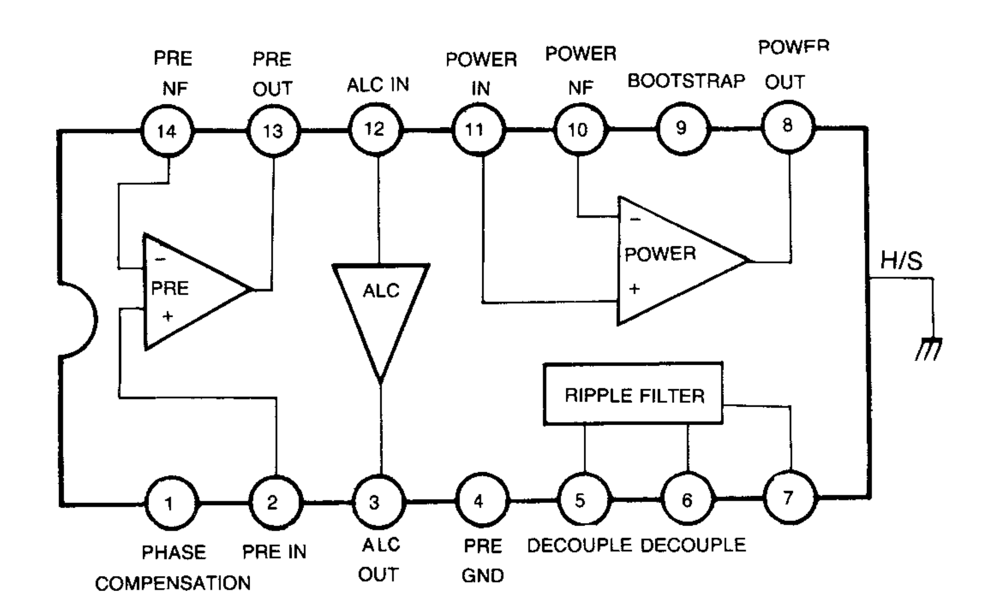
- Suitable for the play and recording functions of mono cassette tape recorders.
- Wide operating supply voltage range: $V_{CC} = 4V \sim 12V$
- **High gain preamplifier and power amplifier.**
- **Output power of power amplifier state**
  $P_O = 1W$ at $V_{CC} = 6V$, $R_L = 4\Omega$, THD = 10%.
- **Soft tone quality at the time of output saturation.**
- **Wide ALC range and small variation in output voltage.**
- **Small shock noise at the time of power on/off due to built-in prevention circuit.**
- **Variable monitor capability due to recording amplifier consisting of preamplifier alone.**
- **Minimum number of external parts required.**

ORDERING INFORMATION

Device	Package	Operating Temperature
KA2213	14 DIP H/S	−20°C ~ +70°C



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	13	V
Power Dissipation	P_D	1.2 2.25*	W W
Operating Temperature	T_{OPR}	−20 ~ +70	°C
Storage Temperature	T_{STG}	−40 ~ +150	°C

* Mounted and soldered on a 50mm x 50mm copper foil of PCB

ELECTRICAL CHARACTERISTICS

(T_a = 25°C, V_{CC} = 6V, f = 1KHz, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Circuit Current	I_{CCQ}	V_{CC} = 6V, V_I = 0		18	30	mA
		V_{CC} = 9V, V_I = 0		23	40	mA
Pre Amplifier						
Open Loop Voltage Gain	G_{VO}	Open loop		85		dB
Closed Loop Voltage Gain	G_{VC}	Closed loop, Play		40		dB
Output Voltage	V_O	THD=1%, Play	0.9	1.2		V
Input Resistance	R_I		21	30		KΩ
Equivalent Input Noise Voltage	V_{NI}	Play		1.0	2.0	μV
ALC Input Level	$V_{I\,(ALC)}$	THD = 1%, Rec	−20	−12		dBm
Power Amplifier						
Closed Loop Voltage Gain	G_{VC}	R_F = 51Ω	43	45	47	dB
Output Power	P_O	V_{CC} =6V, R_L =4Ω, THD=10%	0.7	1.0		W
		V_{CC} =7.5V, R_L =4Ω, THD=10%	1.0	1.5		W
		V_{CC} =9V, R_L =4Ω, THD=10%	1.7	2.2		W
Total Harmonic Distortion	THD	P_O =250mW		0.3	1.5	%
Input Resistance	R_I			30		KΩ
Output Noise Voltage	V_{NO}	R_G = 10KΩ		0.6	1.8	mV
Ripple Rejection Ratio	RR	R_G = 0Ω, V_R =150mV, f = 100Hz	40	45		dB

TEST CIRCUIT

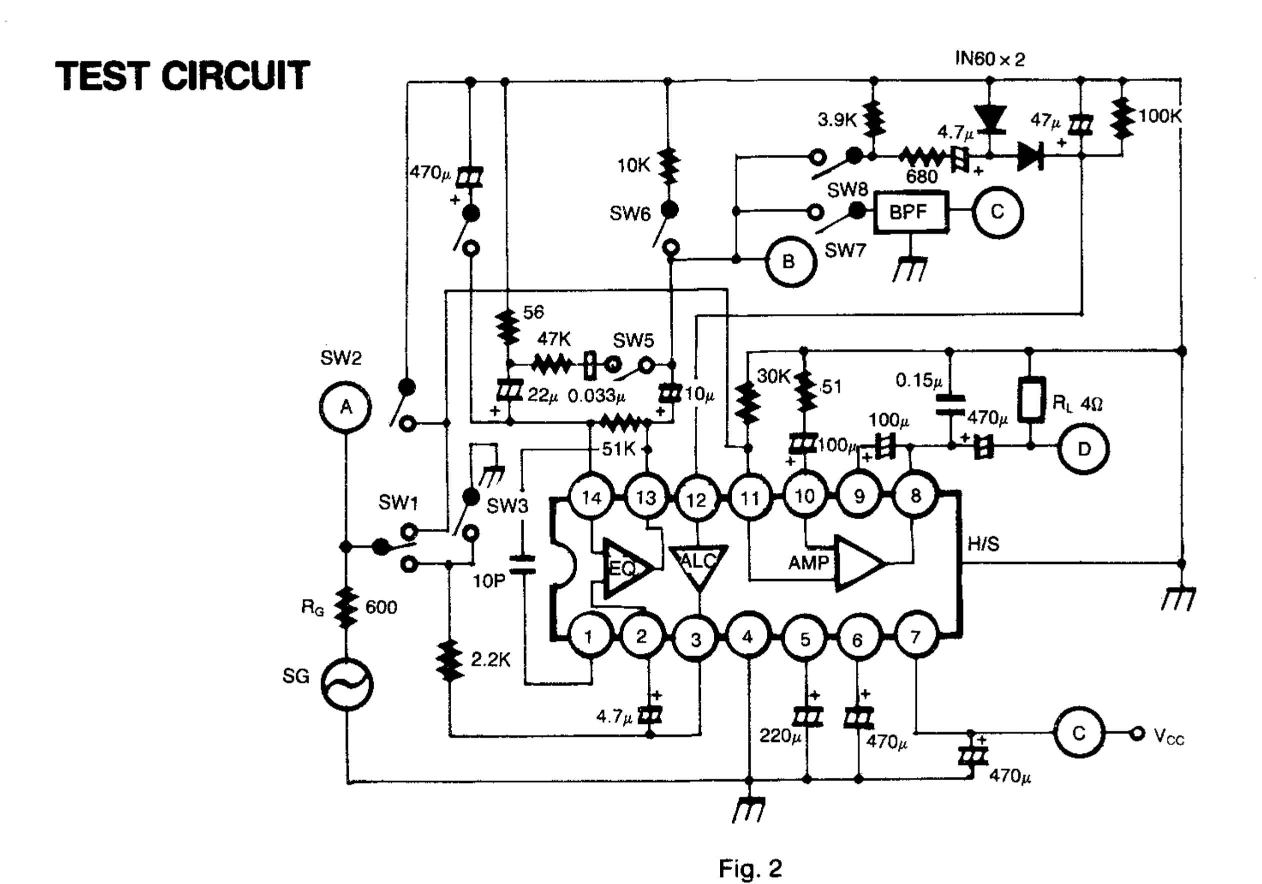


Fig. 2

TEST METHOD

	Characteristic	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	Test Point	Test Method
Power Amplifier	I_{CCQ}		on	on	off	on	on	off	off		Test circuit current
	G_{VC}	2	off	off	off	on	on	off	off	A.D	$G_{VC} = 20 \log V_O/V_I$ (dB)
	P_O	2	off	off	off	on	on	off	off	D	Test output voltage at THD = 10%
	THD	2	off	off	off	on	on	off	off	D	Test THD at output voltage $V_O = 1V$
	V_{NO}		on	off	off	on	on	off	off	D	Test output noise voltage
	RR		on	off	off	on	on	off	off	D	$RR = 20 \log V_{RO}/150$ (dB) Test output ripple voltage (V_{RO})
Pre-Amplifier	G_{VO}	1	off	off	on	off	on	off	off	A.B	$G_{VO} = 20 \log V_O/V_I$ (dB)
	V_O	1	off	off	off	on	on	off	off	B	Test output voltage at THD = 1%
	V_{NI}		off	on	off	on	on	on	off	C	Convert output noise voltage at $R_G = 2.2K\Omega$, $V_{NI} = V_{NO}/G_V$
	$V_{I\,(ALC)}$	1	off	off	off	off	off	off	on	A.B	Test input voltage at THD = 1%

TYPICAL APPLICATION CIRCUITS

1. Mono cassette tape recorder

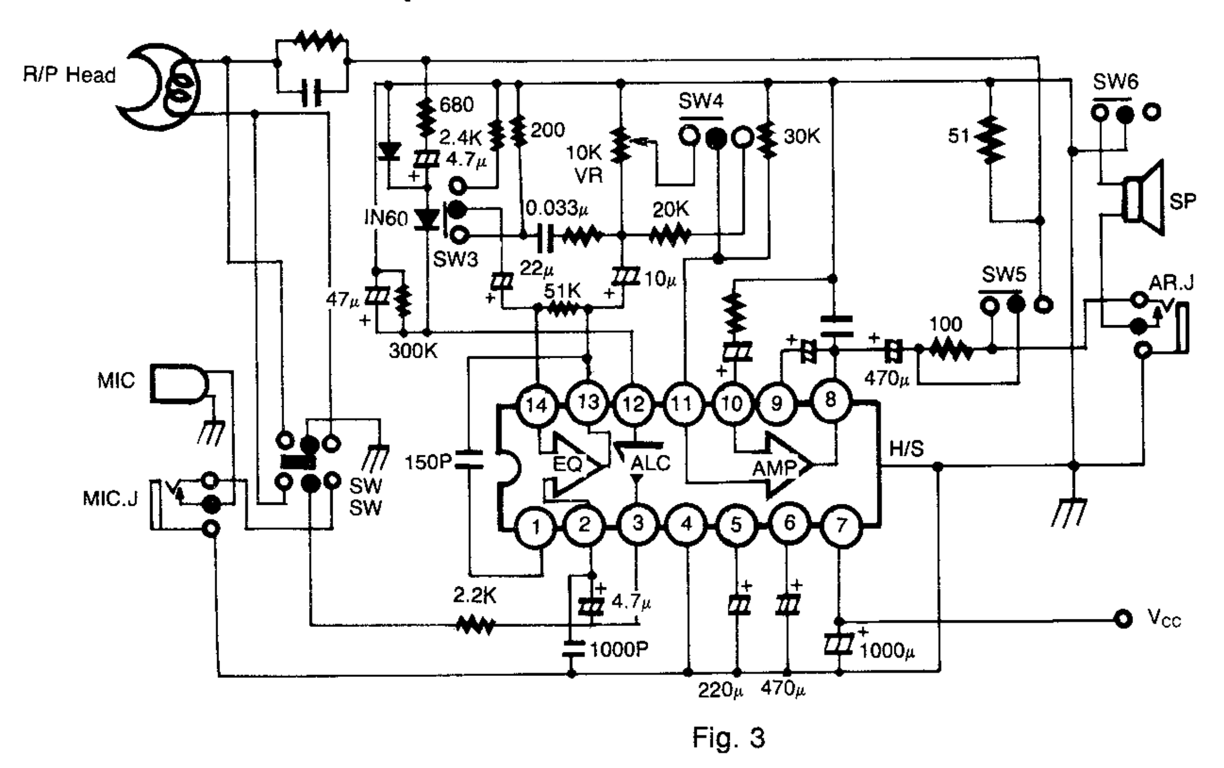


Fig. 3

2. Radio cassette tape recorder

TO RADIO
SW1 TO SW4 (PLAY/REC SW): PLAY

Fig. 4